3.0 SUBBASIN DELINEATION

This section reports on the results of the subbasin delineation completed for the Estero Bay Watershed study area. The purpose for defining these subbasins is to assist in the identification of those subbasins with the greatest potential for urban runoff, agricultural discharge, nutrient and sediment loading, wastewater and industrial discharge, and risk of wetland losses. The subbasins also provide the framework for the modeling work that is to follow this project. The methods and results for subbasin delineation are presented in the following sections.

3.1 Methods

All available data that could provide useful information for subbasin delineation were compiled. These data sources included GIS databases of topography, drainage network, roadways, wetlands, and previous basin delineations (Johnson Engineering, Inc., 1998). In addition, color aerial photographs, REDI maps, USGS quad sheets, the ORACLE permit database, and 303 permit files were researched. Permit file research involved visiting the District office and gleaning information including location of structures, capacities of pumps, direction of flow, permitted allocation, and property boundaries. In general, information that was not contained in the ORACLE database was researched.

Subbasin delineation was accomplished within the basin boundaries developed by Johnson Engineering, Inc. (1998) for the District. The sequence of activities and assumptions made in delineating the tertiary subbasins were:

(1) Compile existing information.

(2) Examine drainage network overlay for determining connections and identifying discrepancies.

(3) Compare canal network with REDI maps (TRW REDI, 1993 and 1994) and aerial photographs to identify discrepancies.

(4) Correct any discrepancies.

(5) Identify secondary drainage system (i.e., channels directly connected to the primary system).

(6) Overlay road network and topographic maps and identify secondary basin boundaries.

(7) Research permit database and files to identify connections via pump, culvert, and weirs.

(8) Where relief is inadequate for defining watershed boundaries, assume roadways are high points. If no other data are available, assume that the mid-point between two canals is the boundary.

(9) Identify tertiary drainage system (i.e., those directly connected to secondary system).

(10) Delineate tertiary subbasins based on guidelines above.

(11) Review property boundaries, and agricultural operating units as presented by the USDA Soil Conservation Service (1993).

(12) Revise subbasin delineation.

In that portion of the watershed examined by Johnson Engineering, Inc. (1998), any deviations from the basin delineations determined by Johnson Engineering were the result of information retrieved from the surface water management permit files and/or field verification. The only significant deviation from those basins delineated by Johnson Engineering, Inc. (1998) found in the delineation presented here is in the boundary between the Corkscrew Swamp and Lake Trafford secondary basins. Given the discharge path for the permitted projects to the north and northwest of the lake, as provided in the permit files for permit numbers 11-00128 and 11-00094, this basin boundary has been revised to reflect the project's discharge to the Corkscrew Swamp. Similarly, based on field observations and topography, some of the area south of Lake Trafford was determined to drain to the Corkscrew Swamp, so was placed in that secondary basin.

3.2 Results

A total of sixty-eight (68) subbasins were delineated. GIS maps were constructed for each of the eleven secondary basins. Each tertiary drainage channel was assigned an alpha numeral consisting of the name of the secondary channel and a sequential number commencing with one at the point nearest to Estero Bay.

The breakdown of secondary and tertiary drainage systems and typical land use is shown in Table 3-1. Complete detailed land use for the tertiary subbasins is presented in Appendix A.

Table 3-1. Tertiary basins in the Estero Bay Watershed.

Secondary Basin	Tertiary Basin	Total Acres	Urban %	Agriculture %	Upland/Natural %	Water/Wetland%
Cow Creek	1	810	7%	0%	3%	89%
	2	1,864	61%	0%	3%	36%
	3	121	18%	0%	0%	82%
	4	132	74%	0%	0%	26%
	5	548	46%	0%	0%	54%
	6	3,906	2%	0%	2%	95%
	7	621	78%	4%	4%	14%
Cow Creek Total Area		8,003				
Hendry Creek	1	2,469	5%	0%	3%	92%
	2	1,139	25%	0%	14%	61%
	3	548	1%	0%	20%	79%
	4	1,036	56%	0%	3%	41%
	5	1,874	27%	29%	26%	19%
	6	449	63%	7%	10%	20%
	7	270	48%	4%	15%	33%
	8	863	66%	7%	19%	8%
	9	517	67%	0%	30%	3%
	10	2,459	59%	0%	38%	3%
Hendry Creek Total Area		11,624				
Ten-Mile Canal	1	129	67%	0%	0%	33%
	2	422	29%	3%	33%	36%
	3	46	8%	0%	87%	5%
	4	153	67%	0%	18%	16%
	5	88	22%	0%	39%	39%
	6	1,728	44%	28%	17%	12%
	7	404	47%	0%	45%	8%
	8	1,441	11%	42%	32%	15%
	9	1,266	53%	24%	9%	15%
	10	473	26%	0%	59%	15%
	11	2,569	42%	12%	32%	14%
Ten-Mile Canal Total Area		8,720				
Six-Mile Cypress Slough	1	8,345	29%	15%	40%	16%
	2	934	23%	3%	17%	57%
	3	3,893	42%	13%	24%	21%
	4	18,354	20%	23%	34%	22%

Table 3-1. Tertiary basins in the Estero Bay Watershed.

Secondary Basin	Tertiary Basin	Total Acres	Urban %	Agriculture %	Upland/Natural %	Water/Wetland%
	5	653	14%	29%	38%	19%
	6	1,968	13%	27%	34%	26%
	7	876	11%	3%	49%	37%
Six-Mile Cypress Slough Total Area		35,023				
Mullock Creek	1	2,973	18%	6%	24%	52%
	2	103	58%	0%	0%	42%
	3	38	28%	0%	56%	16%
	4	3,596	81%	7%	11%	2%
	5	290	53%	0%	43%	4%
Mullock Creek Total Area		7,000				
Estero River	1	1,278	0%	0%	4%	96%
	2	72	0%	0%	87%	13%
	3	2,699	14%	15%	43%	27%
	4	124	64%	0%	16%	20%
	5	2,460	41%	17%	36%	6%
	6	7,467	15%	27%	15%	42%
	7	248	46%	24%	26%	4%
	8	27,647	16%	27%	29%	28%
Estero River Total Area		41,994				
Spring Creek	1	2,527	35%	0%	24%	41%
	2	868	63%	0%	3%	34%
	3	768	69%	0%	13%	18%
	4	77	46%	0%	22%	32%
	5	88	91%	0%	2%	7%
	6	545	40%	7%	47%	6%
	7	2,482	36%	10%	34%	20%
Spring Creek Total Area		7,356				
Imperial River	1	3,464	61%	0%	21%	17%
	2	1,738	49%	2%	32%	17%
	3	1,988	58%	7%	31%	5%
	4	4,695	30%	37%	17%	16%
	5	202	63%	0%	36%	2%
	6	41,568	3%	25%	23%	49%

Table 3-1. Tertiary basins in the Estero Bay Watershed.

Secondary Basin	Tertiary Basin	Total Acres	Urban %	Agriculture %	Upland/Natural %	Water/Wetland%
Imperial River Total Area		53,655				
Corkscrew Swamp	1	19,256	1%	37%	12%	49%
	2	51,143	2%	50%	10%	38%
	3	21,282	3%	37%	13%	46%
Corkscrew Swamp Total Area		91,681				
Lake Trafford	1	1,534	0%	0%	0%	100%
	2	1,127	5%	11%	35%	49%
	3	8,750	16%	40%	12%	31%
Lake Trafford Total Area		11,411				
Barrier Islands	1	15,726	13%	0%	2%	85%
Barrier Islands Total Area		15,726				